Space Weather Forecast

Issued on Thursday, 14 July 2022 at 13:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1-R2 blackouts throughout, with a slight chance of R3 blackouts and S1 proton storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a single Moderate-class flare and numerous Common-class flares observed over the past 24 hours. There are presently six sunspot regions on the visible disc, four of which are large. AR3055 in the southwest remains the largest region but is magnetically simple. AR3057 in the northeast, is the next largest spot, but this appears to also be magnetically simple and has only produced minor flares. AR3053 is also rather large and has a delta configuration within its intermediate penumbra. AR3056 in the southeast, has increased in size and number of spots, but still remains relatively small and simple. There is a new region emerging from the northeast limb, which was the source of the Moderate-class flare at 14/0432 UTC. There are also numerous large filaments on the visible disc, however there were no signs of instability in these in the reporting period, but will need to continue to be monitored. Therefore, no Earth-directed CMEs were observed in the available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been generally elevated, rising from around 500 km/s to 570km/s through the period. The Interplanetary Magnetic Field was mostly weak but rose to moderate after 14/1035/UTC. These parameters would suggest that Earth is under the influence of a high speed stream, most likely from coronal hole 99. Corresponding geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a slight chance of strong (X-class) flares.

Solar Wind / Geomagnetic Activity: Solar winds are expected to remain elevated on day 1 (14th) due to the fast wind from a coronal hole. Through days 2 and 3 (15th-16th) solar winds are forecast to ease towards background levels as coronal hole effects wane. No other enhancements are currently expected during the period. Geomagnetic activity is expected to initially be Quiet to Unsettled, with a chance of Active intervals. Predominantly Quiet geomagnetic activity is expected on days 3 and 4 (16th and 17th).

Energetic Particles / Solar Radiation: The high energy proton flux (greater than 10 MeV) is likely to remain at background levels. There is however a daily Slight Chance of S1 or greater event, due to the presence of two relatively large sunspot regions transiting across the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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